



UNITED STATES NAVY

MEDICAL NEWS LETTER

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Vol. 30

Friday, 1 November 1957

No. 9

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HISTORICAL FUND
of the
NAVY MEDICAL DEPARTMENT

A committee has been formed with representation from the Medical Corps, Dental Corps, Medical Service Corps, Nurse Corps, and Hospital Corps for the purpose of creating a fund to be used for the collection and maintenance of items of historical interest to the Medical Department. Such items will include, but will not be limited to, portraits, memorials, etc., designed to perpetuate the memory of distinguished members of the Navy Medical Department. These memorials will be displayed in the Bureau of Medicine and Surgery and at the National Naval Medical Center. Medical Department officers, active and inactive, are invited to make small contributions to the fund. It is emphasized that all donations must be on a strictly voluntary basis. Funds received will be deposited in a Washington, D. C. bank to the credit of the Navy Medical Department Historical Fund, and will be expended only as approved by the Committee or its successor and for the objectives stated.

It is anticipated that an historical committee will be organized at each of our medical activities. If you desire to contribute, please do so through your local historical committee or send your check direct, payable to Navy Medical Department Historical Fund, and mail to:

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Bureau of Medicine and Surgery (Code 23)
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Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

* * * * *

Management of Renal Trauma

The kidneys, situated as they are behind the protective shield of the lower ribs and the musculature of the trunk and abdomen, are not often subjected to serious injury. Nevertheless, renal trauma, even in a civilian practice, is not uncommon and occurred in one case out of every 2183 admissions to the Rhode Island Hospital during the past 7 years. In all, 50 such patients were admitted to this hospital and constitute the basis for this report.

Unlike most forms of renal disease, in trauma there seems to be considerable question about the best type of treatment that should be used in each case. The difficulty stems from the fact that there are two opposing schools of thought regarding proper methods of treatment. The conservative group believe that nonoperative treatment in most cases yields superior results. Others are of the opinion that early surgical exploration lessens mortality and morbidity, preserves renal function, and tends to prevent crippling late manifestations of renal trauma, such as chronic infection and hypertension. With the idea of achieving one practical policy of treatment, the authors decided to undertake this present study.

Because there are a variety of ways in which the kidney can be injured, it is evident that any rationale of therapy must apply only to similar cases and cannot be made to include all injuries as a group. Therefore, it becomes necessary to establish a classification for renal injuries and to discuss methods of accurately diagnosing the extent of these injuries.

Accordingly, the cases are grouped in the following manner:

Group I. Minor contusion of parenchyma without rupture of intrinsic capsule, with clinical signs and symptoms of hematuria and flank pain, but without pyelographic distortion.

Group II. Major contusion of parenchyma usually associated with rupture of the capsule, with intrarenal and perirenal hematoma and pyelographic compression defects and pelvic clots.

Group III. Major contusion of parenchyma with injury of the drainage system causing intrarenal extravasation of urine with dissection under the capsule and into the renal parenchyma, but without extravasation outside the kidney itself.

Group IV. Major contusion of parenchyma, with injury to the pelvis or calyces resulting in the extravasation of urine outside the renal capsule and under Gerota's fascia. Included in this group are also those cases of shattered kidney, damage to the pedicle, and perforations resulting from bullet or knife wounds.

Once a workable classification has been established, one must next consider diagnostic methods which will insure the placing of each case in its proper category.

Usually the first indication of renal injury is the presence of blood in the urine and tenderness in the flank. Additional tests including blood pressure, hematocrit, and general physical examination, with particular attention to any palpable mass in the flank, will help one to appraise the patient's general condition and the extent of the injury. Clinical judgment is important here, particularly in the presence of shock and/or injuries to other organs.

An intravenous urogram can be a source of helpful information not only about the condition of the damaged kidney, but also about the presence and function of the other kidney. It is definitely indicated if the patient is not in a state of shock, although one must always bear in mind that renal injuries can be more severe than one would expect judging from excretory pyelograms alone.

Considerable information is to be gained by careful clinical observation if early surgical intervention does not seem indicated. Of particular importance are continuous blood pressure observations, urine analyses, hematocrits, and palpation to discover the presence of a mass. Hemorrhage and urinary extravasation are to be carefully watched for.

If these examinations are insufficient to make an accurate diagnosis, and if, in addition, the patient's general condition permits him to be moved for cystoscopic examination and retrograde pyelography, this will usually accurately assess the amount of damage, and should be unhesitatingly done whenever it seems indicated.

Approximately one-quarter of the injuries occurred to children and adults while at play, and included sledding mishaps, falling off buildings and into wells and ditches. A similar number were the result of organized sports including football, basketball, and baseball, industrial and automobile accidents made up the rest—or nearly half—and as might be expected, the most serious, were those involving automobiles.

In this group of 50 cases, there were three deaths and none occurred as the result of the renal injury itself. One was the result of a mesenteric thrombosis on the eighteenth hospital day in a patient whose renal injury had already healed; the other two patients died as the result of compound basal skull fractures.

Twenty-seven of the 50 cases studied were thought to fall into Group I. Physical findings on admission showed costovertebral angle tenderness and muscle spasm, and microscopic hematuria in 11, and gross hematuria in 16 cases. Nineteen intravenous and 2 retrograde pyelograms were performed within 4 days of admission. Treatment in all cases was along conventional lines, consisting of supportive therapy and bed rest with an average hospital stay of 8.7 days. In general, the authors' policy is to keep patients in bed in the hospital for several days after the urine is grossly clear and for at least another week at home after discharge from the hospital. The average time until cessation of hematuria—both gross and microscopic—in this group was 3.6 days.

Eleven cases fell into Group II which consisted of more severe kidney injury associated with pyelographic changes indicating pelvic or calyceal clots or intrarenal and perirenal hemorrhage and hematoma. All patients in this group had varying amounts of pain in the flank and usually flank tenderness and muscle spasm. One patient was admitted with a palpable flank mass, and in 2 patients, a mass developed in the flank which on retrograde examination was found to be due to intrarenal and perirenal hemorrhage, but not to extravasation of urine. All patients had grossly bloody urine or urine described as loaded with erythrocytes; the hematuria cleared in 5 to 20 days (average 11.3 days). All patients had excretory urograms which demonstrated the extent of damage in all but one case.

Treatment of all patients consisted of bed rest; 5 patients required the administration of blood. The hospital stay varied from 6 to 24 days (average 12.7 days). No patient required operation.

On the basis of the essentially favorable outcome of these cases, it would appear that nonoperative management with administration of blood when necessary is the treatment of choice. Intravenous urograms seemed to give satisfactory indication of the extent of damage in all but one case, and here retrograde pyelography gave the necessary information.

Group III includes those patients with major renal damage who, in addition, have extravasation of urine and hemorrhage into the renal parenchyma, or under the renal capsule, but without extravasation outside the kidney itself. These injuries are considerably more severe than those in Group II, as is indicated by the longer average hospital stay, 14 to 25 days (average 16.6 days). There were 6 patients in this group and all had flank pain, tenderness, and muscle spasm. In all, the urine was grossly bloody. Retrograde pyelograms were necessary for accurate diagnosis in 4 of these cases because of poor function on intravenous urogram. All patients were

treated with bed rest, but 3 of the 6 might well have been considered candidates for operative intervention and their cases are discussed in detail.

These 3 cases seem to indicate that operative interference might have considerably shortened the hospital stay, and in 2 of them the final result might have been better. The pathologic condition in these cases consists of considerable edema and contusion of the renal parenchyma, often aggravated by thrombosis of vessels and infarction of kidney tissue. In addition, there are intrarenal blood clots as well as clots under the capsule, and intraparenchymal rupture of the drainage system with extravasation of urine into the parenchyma. Infection is apt to supervene resulting in parenchymal abscess as well as infection of the infarcts. It seems reasonable to suppose that operative intervention to evacuate hematomas and any intraparenchymal collections of blood or fluid would lessen morbidity, shorten convalescence, and definitely improve end results.

Six Group IV cases were the most severely injured of the series. The average hospital stay was 21.3 days; all but one required blood transfusions, and all but one had extrarenal extravasation of urine, usually best demonstrated by retrograde pyelogram. Four of these patients were operated on. Of the 2 who were not so treated, one died on the third hospital day of a basal skull fracture and the other refused operation and was lost to follow-up after discharge on the eighteenth hospital day.

Early operative interference designed to remove a shattered kidney, or to repair and drain a less severely injured kidney seemed to be the treatment of choice. This rarely, if ever, need be done on an emergency basis, but should in most cases be deferred until the patient's condition becomes stabilized and necessary diagnostic procedures have been carried out. In this series, there were no cases in which bleeding was so severe that emergency surgery to prevent fatal hemorrhage was deemed necessary. In such cases, it should be reemphasized that preoperative determination of the presence of a functioning kidney on the uninjured side must be made, even if this entails preoperative cystoscopy and retrograde pyelography. (Parkhurst, E., Landsteiner, E.K., Management of Renal Trauma: Surg. Gynec. & Obst., 105: 393-400, October 1957)

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Treatment of Anemia

The complication of hemolytic anemia occurring in association with a variety of diseases has been described by numerous observers. The pathogenesis of this process has not been elucidated, although an autoimmune mechanism has been found in some patients. This increased rate of erythrocyte destruction is known to accompany diseases, such as leukemia—especially the chronic lymphocytic type—the malignant lymphomas, carcinoma, and collagen diseases. In addition to specific therapeutic

measures directed at the underlying disorders, control of the hemolytic component has been effected by the use of ACTH, the adrenal corticoids and splenectomy. Nine patients with symptomatic hemolytic anemia were treated with prednisone. A review of the case records of this group forms the basis of this report. All observations were made in the hematology clinic and on hospitalized patients at Kings County Hospital Center.

The diagnosis of hemolytic anemia was established mainly by the clinical observation of either a fall in circulating hemoglobin levels or a loss of transfused blood in excess of 1% per day. Gross or occult blood loss was excluded in each case. Reticulocytosis, indirect bilirubinemia, spherocytosis, excessive urinary urobilinogenuria, and red-cell sensitization were occasionally and inconstantly recorded.

In the absence of blood loss from the vascular space, the development of anemia can be attributed to a decrease in production of erythrocytes, acceleration of the rate of destruction of erythrocytes, or a combination of these two mechanisms. In a wide variety of diseases, such as systemic lupus erythematosus, nephritis, cirrhosis of the liver, leukemia, malignant lymphoma and disseminated carcinoma, a continuing decrease in the numbers of circulating red blood cells and a drop in hemoglobin concentration are usually considered to be related to the relentless progress of the associated pathologic process, which in some manner as yet undefined, depresses bone marrow erythropoiesis. Occasionally, hemolysis is quite evident. For example, when the serum bilirubin is elevated, the reticulocyte count is high, the bone marrow shows erythroid hyperplasia, stools and urine contain increased levels of urobilinogen and red-cell sensitization is found along with other evidence of an abnormal immunologic mechanism in the serum.

In patients with malignant proliferative disorders of mesenchymal origin, such as the leukemias and lymphomas, a hemolytic mechanism is not unusual. The one consistent criterion for the presence of a hemolytic process in the present series was the excessive transfusion requirement in the absence of bleeding, implying a loss of the transfused erythrocytes at a rate greater than 1% per day.

The therapeutic value of the adrenal corticoids and ACTH in the management of acquired hemolytic anemia has been widely accepted. Recently, prednisone has been employed with success. At dosage levels equivalent therapeutically to cortisone, less severe side effects have been noted and prednisone can, therefore, be employed in relatively larger amounts. Some patients in the present series were unable to tolerate cortisone in doses presumably therapeutic for the decompensated hemolytic state. Beneficial levels of prednisone were tolerated, however, without severe side effects.

Of the 9 patients treated with prednisone, the hemolytic anemia was controlled in all but one; it was evident that there was a variable dose response from patient to patient. It did appear that one should not eliminate

the possibility of benefit of prednisone until a daily dose of at least 90 to 100 mg. is tried. After the anemia had been controlled it was usually possible to decrease the daily dose slowly. In most cases, however, a level was reached below which relapse occurred when the steroid was reduced further. In no case was it possible to discontinue therapy completely without the occurrence of relapse. The one patient who failed to be benefited was refractory to 100 mg. of prednisone a day.

The rise in hemoglobin concentration after the institution of adequate steroid therapy was frequently dramatic. Also gratifying was the duration of remissions. In no case did the hemolytic process relapse during the periods of observation which varied in the group from 7 to 110 weeks, unless the steroid was reduced or discontinued. The authors' impression was that the effect of the steroid was not a direct one on the underlying disease. In the patients with lymphocytic leukemia there was no evidence of a fall in the lymphocyte count, a reduction in the size of lymph nodes, or a decrease in splenomegaly. The patients with lymphosarcoma similarly showed no reduction in nodes or tumor masses and those with multiple myeloma had no improvement in bone lesions, serum protein abnormalities, or the numbers of plasma cells in bone-marrow aspirations.

A marked symptomatic improvement was often seen at the time when the hemolytic process decreased. Loss of fever, increase in appetite, and sense of well-being, with improvement in strength and energy of the patients, can, in part, be attributed to the nonspecific effects of steroid medications, but most often followed the rising concentration of hemoglobin.

It is possible that the effectiveness of steroid therapy in raising the hemoglobin and red-cell count is due both to a reduction in the rate of hemolysis and to an augmentation of bone marrow erythropoiesis and thereby to a readjustment of the previously decompensated hemolytic state.

The relatively large doses of prednisone used were not entirely unassociated with complications. All patients treated manifested varying degrees of obesity suggesting Cushing's syndrome; glycosuria was noted in several. (Lightman, H.C., et al., Treatment of Symptomatic Hemolytic Anemia with Prednisone: *New England J. Med.*, 257: 631-636, October 3, 1957)

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Diffuse Calcification of the Pancreas

Since 1937, 18 cases of diffuse calcification of the pancreas have been diagnosed in the Department of Radiology of the Philadelphia General Hospital. Two of these cases were previously reported. A review of the literature shows 77 cases recorded; the 16 new cases reported in this article bring the total to 93.

The etiology of diffuse calcification of the pancreas has not been definitely determined. Alcoholism is supposed to have some significance, but this may represent an attempt on the part of the patient to obtain relief from pain rather than a cause for the calcification. Eleven patients in this series gave a definite history of chronic alcoholism. Chronic disease of the biliary tract may have some significance, but Haggard and Kirtley found only 9 cases of biliary calculi in 56 cases of pancreolithiasis in which there was surgical intervention. None of the 6 autopsied or operated cases showed evidence of biliary disease.

The most likely cause of calcification in the pancreas is previous attacks of pancreatitis. Pancreatic calculi are known to be composed of calcium carbonate and tribasic calcium phosphate. Snell and Comfort believed that normal pancreatic juice did not contain calcium in this form and that it was probable that inflammatory processes in the pancreas were responsible for alteration of the chemical composition of pancreatic secretions and the subsequent deposition of calcium within ducts. Edmondson and Fields have shown that in cases of acute pancreatitis a large amount of calcium is mobilized in the pancreas in the area of fat necrosis. The lipase in these areas of fat necrosis splits the neutral fat to fatty acids and glycerin and the fatty acids combine with calcium to form mostly insoluble soaps. Bockus states that in this way calcification of the pancreatic parenchyma may take place in so-called diffuse calcification of the pancreas and similar calcium deposits in the duct walls might also act, in some instances, as a nidus for the development of calculi.

Eighteen cases of diffuse calcification of the pancreas are reviewed. The histologic sections of the pancreas in 6 of these cases revealed calculi in the ductal system and no evidence of calcification of the parenchyma. This finding, the authors believe, indicates that diffuse calcification of the pancreas represents just a progressive or advanced stage of pancreatic lithiasis.

The etiology of diffuse calcification of the pancreas is not definite, but the most likely cause is previous attacks of pancreatitis. Mild forms of cystic fibrosis of the pancreas in infancy may eventually develop diffuse calcification of the pancreas. A diet deficient in protein (amino acid) may have some etiological significance.

The most important and easiest diagnostic procedure is roentgen examination of the abdomen. The most common symptoms are recurrent upper abdominal pain, vomiting, weight loss, and diabetes. However, 2 of the present patients had none of these symptoms and the calcification was diagnosed as an incidental finding in roentgen examination of the abdomen.

The serum amylase is the most significant laboratory study. In 6 of the present cases, the serum amylase was elevated, indicating an associated pancreatitis.

Treatment includes the control of pancreatic insufficiency and pain. When the pain is intolerable, severance of the autonomic fibers supplying the pancreas may help, or if necessary, partial or complete pancreatectomy should be performed. Sphincterotomy and cholecystectomy may be of value.

Pulmonary tuberculosis was the cause of death in 6, or 33.3% of the present cases. Of the 27 recorded deaths in patients with diffuse calcification of the pancreas, 15, or 55.5%, were due to tuberculosis. This high incidence remains unexplained. (McGeorge, C.K., et al., Diffuse Calcification of the Pancreas: Am. J. Roentgenol., 78: 599-606, October 1957)

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Urinary Calculus Disease

Surprisingly little has been written on urinary calculus in childhood during the past decade, although it is one of the chief problems of pediatric urology. Only rarely have articles appeared in a pediatric journal and much that was previously accepted is being questioned. In recent years, careful studies have been carried out on various animal species under different pathological conditions.

Little has been done on the influence of race or ethnic origin and heredity and no conclusive reports have been published on the influence of climatic and other environmental conditions. This report deals with thirty-one cases of urinary lithiasis in children coming from different environments, belonging to distinctly different ethnic groups, and observed by the same medical personnel.

The thirty-one cases of urinary lithiasis reported were observed at the Rambam Government Hospital in Haifa from 1949 through 1956. They represent all the cases of urolithiasis diagnosed among all the patients hospitalized for various illnesses during this period of time. Because no elective factor was involved in the assessment of these cases, this group of patients may be considered a random sample and, therefore, suitable for statistical evaluation.

The age of the patients at the time of their hospitalization ranged between 2 months and 13 years. Twenty were males and eleven females. Twenty of the thirty-one patients had a single stone each, four had multiple stones in one kidney, six had stones in both kidneys, while one had multiple stones in both kidneys and both ureters. In ten cases, a pyelolithotomy was performed, in four cases, a ureterolithotomy, and in three, a cystotomy; in one case, the diseased kidney was removed. Of the remaining thirteen cases, spontaneous expulsion took place in five, four patients were not operated upon in this hospital, and in four, the calculi were revealed at autopsy.

The patients are grouped according to their ethnic origin. Five ethnic groups are recognized in Israel: the Sepharadic Jews from the Balkan countries, Turkey, Spain, and Portugal; the Ashkenazic Jews from all the eastern and middle European countries; the Eastern Jews from the Arab countries in Asia and Africa (Iraq, Iran, Egypt, Morocco, Tripoli, Algeria, Tunisia, and others); the Yemenite Jews, originating in Yemen and Aden; and the Israeli Arab group.

All the Jewish patients and/or their parents were new immigrants. Most of them have lived for varying periods in immigrants camps. This implies primitive living quarters—mostly tents and barracks—and subsistence on a poor monotonous diet. Some of the children came directly from these camps while the rest were hospitalized for only relatively short periods after leaving them. The Arab children came mostly from the impoverished elements. Their standards of living and social development were low.

Numerous factors have been suggested to explain urinary calculogenesis. Prominent among the many theories are the colloid-crystalloid imbalance theory, the vitamin A deficiency theory, the endocrine disturbance theory, and theories based on heredity, racial, and climatic influences. It is universally agreed that multiple factors are required for the formation of a urinary stone, but in spite of much experimental and clinical evidence neither a single one nor a group of the factors mentioned has been definitely proves calculogenetic. The majority of urologists at present regard urinary calculus not as a disease entity, per se, but rather as a symptom of certain abnormal states within the body. When the proper conditions exist, one or more of the calculogenetic factors can cause the formation of a stone.

The view of most modern urologists is that calculogenetic factors can cause urolithiasis in patients debilitated by poor nutrition. Geographic studies have shown urinary stones to be rare among populations in dairy-farming countries and to be prevalent in people living on a monotonous diet, particularly where cereals form the staple food. Thomson reported that calculi were thirty-two times more frequent among charity patients in China than among the children of the well-to-do. With the improvement of infant and child nutrition, stones have become rare in children in the United States and England. Furthermore, it has been observed that when inhabitants of countries where calculogenesis is rife are settled elsewhere, they preserve the tendency toward urolithiasis only so long as they preserve their tribal and ancestral food and community habits. When food and feeding habits are improved, the incidence of urinary stones steadily diminishes.

The authors' view is that the greater frequency of lithiasis among the Yemenite Jewry group, the Eastern Jewry group, and the Arab children is related principally to the deficient food diet; as the mode of life and the social and food habits of the different Jewish communities in Israel improve, it should be possible to test this hypothesis in a long-range study. (Levy, D., Falk, W., Urinary Calculus Disease Among Israeli Immigrant and Arab Children: *J. Pediat.*, 51: 404-411, October 1957)

Inflammations of the Nonlactating Breast

The title is intended to include infectious mastitis, traumatic mastitis, and a variety of conditions in which an inflammatory process is considered in the differential diagnosis. In the nonlactating breast, the manifestations of inflammation are varied and the responsibility for the management of them is divided among several specialties. No text brings this group of lesions together; therefore, it seems desirable to present them for consideration.

Infectious Mastitis

Acute infections in the nonlactating breast are much more common than is generally recognized. When an infection develops in a location away from the areola, it usually behaves as a nonspecific infection in any other part of the body would behave. If, however, the infection involves the areola, recurrence is common and the infection may persist for weeks, months, or years. The tendency to become chronic because of location in the areola has received scant recognition in the literature.

The infectious process in the area of the areola may originate in the glands of the skin, the subcutaneous tissue, or in a duct of the mammary gland. The point of origin of the infectious process may be difficult to determine, but it may be assumed that the duct is involved primarily or secondarily in the abscesses and fistulas which are resistant to treatment. Involvement of a duct may not be the sole cause of the persistence of subareolar infections, but it is an important feature.

Treatment of subareolar infections consists of adequate surgical care, identification of the infecting organism, demonstration of sensitivity to the different antibiotics, and use of the antibiotic indicated by the sensitivity test. The surgical procedure indicated varies individually from mere observation, aspiration, incision, and drainage to simple mastectomy.

Tuberculosis

Tuberculosis of the breast is relatively uncommon when compared with the frequency of tuberculosis in other organs. Invariably, it is unilateral. It occurs in youth or middle age. Although some authors consider tuberculosis in other structures significant in the diagnosis of the infection in the breast, in the author's experience that association is unusual. While it may appear in a lactating breast, that association is also unusual.

The first sign of the disease is usually a painless swelling. The lump enlarges slowly and at this stage the clinical resemblance to malignancy may be close. As the mass increases in size it becomes attached to the skin. Redness and tenderness of the area suggest infection. Liquefaction of the center of the mass accounts for a sense of fluctuation. At this point, it may break through the skin, may be aspirated, or it may be incised. A

history of repeated incision with recurring abscesses and sinuses strongly suggests the diagnosis of tuberculosis. Confirmation may be obtained by bacteriologic examination and animal inoculation.

The use of antibiotics has reduced the extent of surgical procedures in the treatment of tuberculosis as well as other infections of the breast. Failure to respond to antibiotics is an indication that the lesion may not be an infection.

Chemical Mastitis

Two uncommon conditions may be classified as chemical mastitis, namely, fat necrosis and plasma-cell mastitis. Their etiology is obscure, but the theory that they are a response to fatty material is acceptable. Because both lesions either show evidence of inflammation or resemble an inflammatory process at some phase of their development, they are included in the differential diagnosis of inflammation.

Fat Necrosis

Fat necrosis occurs in large, fatty, or pendulous breasts. In the early phase, it may be mistaken for inflammation and in the later phase for carcinoma. Discovery of a lump brings the patient for examination. She may recall a definite trauma, she may have a vague recollection of trauma, or none at all. When the lump is tender and painful, a question of inflammation may arise. Absence of redness, local elevation of temperature, and constitutional symptoms exclude a diagnosis of inflammation. In the later phase, exclusion of a diagnosis of carcinoma offers more difficulty. The accepted treatment for fat necrosis is local excision. The early phase when the symptoms and signs suggest the possibility of inflammation is relatively short.

Plasma-Cell Mastitis

This is an inflammatory lesion of the breast which occurs during the reproductive period. Nonlactating parous women are the usual subjects of this condition. Because fewer than 100 cases have been reported, it may be considered rare.

The clinical picture presented depends upon the phase in which the condition is first observed. The earliest manifestation is inflammation which often begins suddenly with pain, tenderness, diffuse swelling of the breast, and mild constitutional symptoms. The intensity of the symptoms varies considerably, but mildness of symptoms is usually characteristic. The patient may recall the signs of inflammation only vaguely when she is observed for the first time in the later stage of the disease. The extent of the involvement of the breast usually includes more than one quadrant and may involve the whole breast. The acute phase subsides and a residual mass in the deeper tissue remains. Retraction of the nipple, fixation to

the skin and surrounding tissue are common. In this phase, the differential diagnosis from cancer becomes important. The duration of the process varies from weeks to months and even years. Sometimes, the mass spontaneously disappears. Frequent enlargement of the axillary glands is not significant.

The chronicity of this condition justifies conservatism in the treatment of the inflammatory phase with careful observation to rule out a more serious condition.

Traumatic Mastitis

Traumatic mastitis is a mild inflammation of breast tissue in response to repeated slight trauma. It occurs most frequently during the reproductive years, but it may appear occasionally after the menopause. It is most common in the third and fourth decades when the physiologic activity of the breast is high. The onset is the discovery of a tender area or a lump in the breast. The patient may have found the lump herself because her attention was attracted to the tender area, or she may have accidentally felt the lump. Publicity for cancer detection induces an increasing number of women to examine their breasts routinely so that many patients seek advice because of any lump on the skin or in the breast that they may have found. The woman may have had a trauma to her breast and examined it to find the result of the trauma.

The only systemic manifestation of traumatic mastitis is the emotional response. The temperature is not elevated. The blood is not changed. Local examination reveals one or more lumps in one or both breasts. The skin over the area is not changed except for occasional redness or pressure marks from the clothing. Tenderness over the mass varies, but is usually slight. The margins of the mass are not sharply defined. Induration is not extreme, but it is sufficient to show a distinct difference between the mass and the normal breast tissue. The size ranges from a few millimeters to several centimeters with an average of about 2 cm. The shape varies, but is usually spherical. When it occurs in the lower part of the breast, it is often elongated transversely.

When traumatic mastitis is suspected, the diagnosis may be confirmed by bandaging the whole breast to prevent any manipulation. After several days, the bandage is removed and if the mass has decreased, any neoplasm may be excluded. If the inciting trauma is located and removed, the mass subsides.

Inflammatory Carcinoma of the Breast

Inflammatory carcinoma of the breast is a term applied to a cancer associated with manifestations of inflammation. The tumor is not a specific type, but it grows rapidly and is very invasive. The inflammatory manifestations include induration, redness, increased local heat, pigskin or

orange-peel appearance, tenderness, and sometimes local pain. Most of the inflammatory signs may be explained by invasion of the subdermal lymphatics and capillary congestion, but bacterial infection is rarely a factor. Rapid extension may soon involve the entire breast and spread to the neck and arm, resembling erysipelas; hence the reference to the condition as erysipeloid carcinoma. Systemic symptoms are lacking.

The prognosis of the disease is always grave on account of the malignancy. The inflammation is secondary and not serious. Unfortunately, valuable time, too often, has been wasted while the inflammation was treated and the cancer overlooked. Agreement concerning the best method of treatment of inflammatory cancer of the breast has not been reached.

Chronic Cystic Mastitis

Chronic cystic mastitis may be mentioned in passing because the word mastitis denotes inflammation. In reality, inflammation is not a characteristic of any of the various lesions included under the general term chronic cystic mastitis. Because the presenting symptoms of these lesions may be pain, tenderness, or swelling, it sometimes becomes necessary to rule out inflammation. The absence of the other cardinal symptoms, local heat, and redness, excluded the diagnosis of inflammation. The main problem for differential diagnosis is the possibility of the presence of cancer which is not pertinent to this discussion.

Scleroderma

Dermatologic lesions may appear on the breast just as on any part of the surface of the body. When the skin of the breast is involved at the same time as other areas, the diagnosis of the lesion of the breast does not present a particular problem. If, however, the breast bears a solitary lesion, the diagnosis may be difficult.

Localized scleroderma is a disease of unknown origin. It is benign, self-limited, and has no influence on the span of life. There is no specific treatment.

The female breast is an important visual focal point of femininity. Anything that threatens to mar or sacrifice that evidence of femininity is a justifiable cause for anxiety. The significance of the anxiety is not always appreciated by the physician consulted, although it is very important to the patient. Because the conditions which have been presented rarely threaten life, the management of these conditions may include due consideration for preservation of natural structures. Thoughtfulness in diagnosis and conservatism in treatment will earn the gratitude of the patient. (Pratt, J. P., Inflammations of the Nonlactating Breast: *Am. J. Obst. & Gynec.*, 74: 844-850, October 1957)

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The Oral Cavity and Disease

Sir William Osler has called the oral cavity a mirror of the rest of the body. Yet while the changes in eyegrounds that are associated with systemic diseases are well recognized, the changes in and around the mouth do not seem to have equal appreciation by the physician.

Oral tissues are unusually sensitive indicators of the general health status of an individual. This easily accessible, painless diagnostic site particularly reflects initial signs of nutritional deficiencies, endocrine imbalances, gastrointestinal disturbances, communicable diseases, blood dyscrasias including the anemias, and excessive exposure to radioactivity. In addition to the many periodontal manifestations of medical illness, not the least important reflection of disease can be demonstrated by the teeth themselves. Up to 37% of persons with congenital syphilis have been found to have hypoplasia of the occlusal surface of all four first molars.

With growing emphasis on the dangers of an individual receiving too much radioactivity, it is important to know what specific changes the oral cavity does show as a result of exposure to radiation. Along with the commonly recognized signs of overexposure to naturally occurring or man-made radioactive substances, such as alopecia, brittleness of the nails, and pigmentation, certain diagnostic signs appear in the mouth. In a population exposed to atomic bombing, petechial mucosal lesions have been observed associated with aplastic anemia. Other signs include a glassy smooth tongue that is particularly susceptible to infection, gangrenous ulcers of the lips, and ulcers that penetrate large areas of the buccal mucosa. It is believed that the mucosal findings are similar to those occurring elsewhere throughout the gastrointestinal tract. Exfoliation of the teeth due to osteomyelitis of the mandible was frequently observed. One interesting finding was the increased radiant energy detected in the metallic restorations of the mouth that was not present in the adjacent living tissue.

Dental x-ray pictures can reveal the only signs of osteonecrosis and osteomyelitis that might occur from overexposure in x-ray technicians, as well as research men and others closely associated with radioactive substances. Finally, one of the most commonly reported signs of overexposure to radiation is xerostomia, the dry mouth that results from lack of salivary flow. This manifestation does not depend solely on locally applied radiation, but can reflect over-all body exposure.

While it may seem that the physician examining the teeth and surrounding structures is doing a dentist's job, or the dentist who diagnoses diabetes by oral lesions is overlapping into the medical field, oral manifestations of disease indicate the close proximity of the two doctors' areas of practice. The physician and the dentist, working together, have provided a much better understanding of oral medicine, and in mutually reciprocating their clinical findings, as well as their scientific research, they have markedly improved

the over-all care of the patient. The field of radiation protection may well be the impetus to enjoin—in fact as well as theory—the two health specialties. (Editorial: J.A.M.A., 165: 159, September 14, 1957)

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The Surgeon General Speaks at the American
Drug Manufacturers Meeting

Rear Admiral Bartholomew W. Hogan, Surgeon General of the Navy, spoke on Military Medical Problems of the Future at the Annual Meeting of the Research and Development Section of the American Drug Manufacturers Association, held at the Westchester Country Club, Rye, N. Y., October 11, 1957. Admiral Hogan stated:

"Many of you have actively participated in the close cooperation there has been between various of your companies and the Bureau of Medicine and Surgery in connection with certain phases of our research and development program. Our interests meet and blend at many points, and it is because we can go so much farther together than we can separately that I am happy to discuss with you the military medical problems of the future as I envision them. To present these problems in their proper perspective, however, I will refer also to pertinent events in the recent past and will tell something of what is going on at present." One important yardstick measuring medical progress is the mortality rate of military personnel. This record, both in war and in peace, is a proud one. "Deaths from battle injuries were reduced from over fifty percent prior to World War I and from about ten percent during World War I to between two and three percent in World War II and in the Korean conflict. This was accomplished with the aid of antibiotics and the liberal use of preserved blood and its derivatives, but another factor also was of great importance—the use of trained surgical teams in combat areas. The facilities for life-saving surgery that were maintained close to the front lines and, in the Korean conflict, rapid helicopter transportation of the wounded to field hospitals or hospital ships where they could have expert treatment, were important factors in the new wartime mortality figures."

Admiral Hogan also elaborated on the serious responsibility of the military—particularly in wartime—for the treatment of casualties requiring reconstructive surgery, and research and development in the field of tissue preservation and transplantation essential for meeting this requirement. Since the Navy Tissue Bank was established at Bethesda six years

ago, procurement of human tissues and preservation largely by freeze drying in a relatively high vacuum has been extremely successful. Tissues shipped to all parts of the United States and many foreign countries have included bone, skin, fascia, dura mater, cornea, cartilage, and arteries. At the present time, bovine embryo skin is being evaluated as a temporary biologic dressing. An attempt also is being made to develop a plastic artificial cornea. Admiral Hogan further stated:

"A problem continually facing us is to find methods of combating the effects of nuclear weapons, and research is in progress on radiation, blast, and thermal effects. Special effort is being directed toward finding improved methods for treating burns. Deep and extensive burns produce death through loss of body fluids and by producing open surgical wounds through which bacteria can enter. One of our major efforts is to devise a wound covering or dressing that is physiological in nature, to prevent the loss of fluid and the ingress of microorganisms. Another is to find better methods for preserving blood, which is the most desirable replacement for lost fluid, or to produce synthetic blood replacement substances that will be more satisfactory in use than those now available.

It is in the field of aviation that the military medical problems of the future are most abundant and striking. Here every radical new development in the characteristics and capabilities of manned aircraft must be balanced against the ability of human beings to withstand the stresses and strains involved and to perform efficiently under adverse conditions. Previously unheard-of speeds and altitudes are being made possible by radically improved airplanes, but even the best machine is still dependent on the man who operates it. A current saying is that 'The efficiency of a man-machine system is the product of the efficiency of the man times the efficiency of the machine.' For flights at the more extreme altitudes already being reached, the only solution is a sealed cabin which, like the submarine, poses all the problems involved in providing a total environment. Humidity, odors, heat, and cold must be controlled. Toxic agents must be eliminated, and in providing sufficient oxygen, poisonous ozone becomes a problem requiring ozone filters if air compressors are used above 65,000 feet. In space flight, cosmic and ultraviolet rays become a menace. Weightlessness may interfere seriously with performance and time disorientation can disrupt eating and sleeping habits. Empty field (or space) myopia may make it difficult to focus on objects in the cabin when a blank sky offers no cue on which accommodation and convergence can act. Strong light and black shadows may interfere with visual perception."

In closing, Admiral Hogan stated that he felt sure that the military could count on the expert assistance of the American Drug Manufacturers Association in the future as has been done in the past.

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From the Note Book

1. Rear Admiral B. W. Hogan, Surgeon General of the Navy, was elected to the Board of Trustees of the American Hospital Association at their 59th Annual Meeting. The Board of Trustees, the governing body of the Association, consists of nine outstanding leaders in the field of hospital administration selected by the House of Delegates for 3-year terms. The immediate past president, president, president elect and treasurer also serve as ex officio members of the Board. (TIO, BuMed)

2. Rear Admiral T. F. Cooper MC USN, Commanding Officer of the National Naval Medical Center, Bethesda, Md., represented the Bureau of Medicine and Surgery at the 43rd Annual Clinical Congress of the American College of Surgeons, October 12 - 18, 1957. Rear Admiral Cooper is a Governor of the American College of Surgeons. (TIO, BuMed)

3. Captain T. J. Canty MC USN, Chief, Amputee Service, U. S. Naval Hospital, Oakland, Calif., monitored an exhibit at the Annual Meeting of the State of Washington Governor's Committee on Employment of the Physically Handicapped held at Olympia, Wash., October 3 - 4, 1957. (TIO, BuMed)

4. Cordon Gray, Director of Defense Mobilization has announced the appointment of Dr. W. Palmer Dearing to the newly created post of Assistant Director for Health in the Office of Defense Mobilization. Dr. Dearing has been serving as Deputy Surgeon General of the Public Health Service, Department of Health, Education, and Welfare, for the past nine years. He assumed his new post on October 1, 1957. In making the announcement, Mr. Gray said that the new position has been established to provide better coordination of all the health activities of the Federal Government which are necessary to achieve and maintain a state of readiness for national defense. (ODM)

5. For the week ended October 4, 1957, the reports of influenza and influenza-like disease followed the pattern of the previous 3 or 4 weeks, namely, an increase in cases in many areas. The estimated total number of cases was 350,000. This was based on various types of information; it includes estimates of prevalence or incidence made by several State health officers, the number of individual cases notified by physicians in some States, or the

amount of absenteeism in schools in others. The estimated cumulative total of 1,077,000 includes delayed reports from several States. These figures must be considered as very rough estimates and should not be regarded as showing the true incidence of influenza. (PHS, HEW)

6. Experience with tetanus at Charity Hospital, New Orleans, for the past 14 years, was analyzed and compared with that previously reported. A review of the various components of therapy emphasizes the lack of specificity of any of the agents employed and suggests that the most important single factor is good supportive care of the patient. (Ann. Surg., September 1957; O. Creech, Jr., M.D., A. Glover, M.D., A. Ochsner, M.D.)

7. A study was conducted of approximately 70 patients with adenocarcinoma of the endometrium treated by one physician in private practice. Special attention was given to the high preponderance of endocrine stigmas found among patients in this series. Tables show the incidence of diabetes, aberrations of weight and stature, concurrent breast disease, and other glandular irregularities. The value of endometrial biopsy as a means of immediate diagnosis is stressed. (Am. J. Obst. & Gynec., October 1957; J. A. Wall, M.D., R. Mastrovito, A. B.)

8. The potentialities of the cytologic examination of smears are discussed with reference to: the localization of inflammatory reactions in the vagina, the cervix, and the endocervix; the classification of these inflammatory conditions into mild, marked, acute, and chronic reactions. The technique of preparation and the interpretation of such smears is described. (J. Clin. Path., September 1957; G. L. Wied, M.D.)

9. Primary Hodgkin's disease of the stomach is a rare condition, approximately 36 cases have been reported in American literature. It appears that the ideal treatment of the primary type of the disease is gastric resection followed by deep x-ray therapy. (Am. J. Surg., October 1957; A. S. Jackson, M.D.)

10. Four cases of esophageal webs are reviewed. The etiology is discussed and it is believed that webs occur congenitally in connection with the Plummer-Vinson syndrome and in connection with other not definitely known causes. (Am. J. Roentgenol., October 1957; H. K. Waldman, M.D., A. Turnbull, M.D.)

11. Dr's Daniel L. Kline and Jacob B. Fishman, Yale School of Medicine, have reported on a new enzyme that may dissolve dangerous blood clots after they form in the body. The enzyme, known as plasmin, is now being tested in humans. Plasmin is injected into the blood stream as soon as a

blood clot is detected. If it works as well in humans as it has in animals, the clot will be dissolved and the blood supply of the affected area will return to normal within a few hours. (Medical Science, 25 August 1957)

12. Defects in the tooth enamel of brain-damaged children may give a clue as to when the brain was damaged, W.F. Via, Jr., D.D.S., and Dr. J.A. Church, Henry Ford Hospital, Detroit, Michigan have found. The report was made in the Journal of Diseases of Children, August 1957. Tooth enamel forms at a definite rate and, once formed, can not be remolded or reorganized like most other tissues. However, its growth is interrupted, causing enamel faults, by events that may also cause brain damage. By spotting enamel faults and checking medical histories for possible brain-damaging events, the time of the event can be more accurately dated and the cause confirmed, the authors reported. (Medical Science, 10 September 1957)

13. The incidence, symptomatology, and diagnostic findings in 253 patients with carcinoma of the esophagus are analyzed in Surg. Gynec & Obst., October 1957; R. W. Postlethwait M.D., et al.

14. A brief review of the incidence, etiology, symptoms, diagnosis, and treatment of favism is presented in J. Pediat., October 1957; H.C. Tolmas, M.D.

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BUMED NOTICE 6150

8 October 1957

From: Chief, Bureau of Medicine and Surgery
To: Ships and Stations Having Medical/Dental Personnel
Subj: DD Form 877 (Request for Medical/Dental Records); use of in the Naval Establishment
Ref: (a) ManMed Art. 23-216A, Tabulation of DOD Forms

This notice advises that DD Form 877 has been standardized by the Department of Defense for use by the three services in those instances where it is necessary to request medical/dental records of individuals.

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BUMED NOTICE 11011

10 October 1957

From: Chief, Bureau of Medicine and Surgery
To: All BuMed Managed Activities

Subj: Physical Inventory of Shore Establishment

Ref: (a) DODInst 4165.3 of 11 Mar 1955
(b) BuDocksInst 11011.27 of 1 Feb 1957
(c) BuDocksInst 11011.33 of 3 Sep 1957
(d) NavCompt Manual Vol. 3, Chap. 6

This notice alerts activities to the revised date of the physical inventory (classes I and II property) of the Shore Establishment.

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BUMED NOTICE 6120

10 October 1957

From: Chief, Bureau of Medicine and Surgery
To: All Ships and Stations

Subj: Annual physical examination of officers

This notice outlines procedural changes in conduct of the annual physical examination of officers.

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BUMED INSTRUCTION 1510.2B

11 October 1957

From: Chief, Bureau of Medicine and Surgery
To: Ships and Stations Having Dental Personnel

Subj: Training available to Group XI, Dental Ratings

Ref: (a) NavMed P-5029, Catalog of Dental Technician Schools and Courses (1955)

Encl: (1) Dental Technical Training Schools and Courses
(2) Sample Application for Dental Technical Training Schools and Courses

This instruction promulgates information on training available to Group XI, Dental Ratings, and to supplement reference (a). BuMed Instruction 1510.2A is canceled.

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DENTAL**SECTION**

Admiral Taylor to Represent the Surgeon
General at ADA Meetings

Rear Admiral Ralph W. Taylor, DC USN, Inspector General, Dental, will represent the Surgeon General of the Navy at the 98th Annual Session of the American Dental Association on November 4 - 7 1957, at Miami Beach, Fla. Admiral Taylor, as Chairman of the Committee on Federal Oral Surgical Services, will also attend the Miami Beach Meeting of the American Society of Oral Surgeons, October 30 - November 2, 1957.

New Short Postgraduate Courses at NDS

In recognition of the need for continuous training of career Dental officers, and in view of the high caliber of instruction available within the Navy, the Dental officer training program for fiscal year 1958 has been expanded to include various short postgraduate courses at the U. S. Naval Dental School, National Naval Medical Center, Bethesda, Md. Fifteen courses will be presented in eight dental subjects for a total enrollment of 106 dental officers. Assignments, at present, will be limited to career Dental officers on active duty in the First, Third, Fourth, Fifth, Sixth, and Ninth Naval Districts; and the Severn River and Potomac River Commands. Commandants of these districts and river commands have been informed of quotas for their areas.

Requests for assignment to the courses should be submitted in accordance with Article 6-82, Manual of the Medical Department and BuMed Instruction 1520.2D.

Courses and schedules are listed:

Complete Dentures

November 18-22, 1957

May 12-16, 1958

Partial Dentures

January 6-10, 1958

May 5-9, 1958

<u>Oral Surgery</u>	January 6-10, 1958
	February 3-7, 1958
<u>Periodontics</u>	January 7-10, 1958
	February 4-7, 1958
<u>Endodontics</u>	January 13-17, 1958
	March 31 - April 4, 1958
<u>High Speed Orientation</u>	January 13-17, 1958
	February 17-21, 1958
<u>Casualty Treatment</u>	March 3-7, 1958
<u>Crown and Bridge</u>	April 21-25, 1958
	May 5-9, 1958

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Short Postgraduate Courses for Dental Officers

During September 1957, twenty-eight Dental officers were authorized to attend short postgraduate courses in civilian dental schools. Most of the courses are of one to three days' duration in subjects which range from High Speed Technique in Operative Dentistry to Oral Pathology and Oral Medicine. Officers are reimbursed for tuition expenses when requests are submitted and approved in accordance with BuMed Instruction 1520.2D.

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Dental Officers Attending Civilian Institutions

During the current fiscal year, three Navy Dental officers are receiving full-time instruction in civilian dental institutions as follows:

Endodontics and Radiology

CDR John F. Bucher DC USN - W.K. Kellogg Foundation, University of Michigan

Periodontics

CAPT Lambert A. Benson DC USN - College of Dentistry, Ohio State University

CAPT Robert H. Loving DC USN - Graduate School of Medicine, University of Pennsylvania

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RESERVE SECTION

New Correspondence Course

The Medical Department correspondence course, Hospital Personnel Administration, NavPers 10734, is now available to Regular and Reserve officers and enlisted personnel of the Medical Department. This course consists of five (5) objective type assignments and is evaluated at fifteen (15) Naval Reserve promotion and/or nondisability retirement points.

This course is designed to familiarize personnel with the basic principles of hospital personnel administration as applied to any industry and related specifically to the hospital industry, private or industrial, governmental, or armed forces. In government, administration is often used in the same sense as management is used in private industry. In recent years, hospital economics has changed as problems of hospital personnel administration have changed. Hospitals today, in order to render the highest level of hospital service, must adopt modern principles of business administration. The cornerstone for these basic principles is a sound personnel management program.

This course serves as an introduction to the primary areas of personnel administration which bear upon the special needs of naval hospitals. It emphasizes the recognition of practical variations in personnel policy required by the particular situation. Applications of personnel policy to problems encountered in the field are explained by means of situational items.

Medical Department personnel who successfully complete this course will acquire an understanding of the principles of hospital personnel administration as they relate to personnel; thus, MD personnel will assume with ease and understanding the responsibilities associated with varying conditions found in hospitals.

Applications for this course should be forwarded on NavPers 992 (Rev. 2-56) via applicant's command to Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md.

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A New Policy on Promotion Points for Active Duty and Residency Training

BuPers Instruction 1416.4B, to be promulgated in the near future, outlines new regulations concerning the crediting of promotion points.

Promotion points for extended active duty will be as follows:

- a. For each month of extended active duty (not including training duty) subsequent to 30 June 1955: two promotion points.
- b. For each month of extended active duty (not including training duty) between 1 July 1950 and 1 July 1955: one promotion point. Extended active duty includes temporary active duty which is intended to be, and does, exceed 30 days. It does not include special training duty in excess of 30 days.

Promotion points for residency training will be as follows:

- a. Medical and Dental officers enrolled in a course of residency training approved by the Chief of the Bureau of Medicine and Surgery will, upon their application, be credited with one promotion point for each semester hour or equivalent thereof satisfactorily completed. Not more than twelve promotion points will be credited during one fiscal year.
- b. To be creditable, courses must have been completed in present grade since 1 July 1950. For courses completed prior to 1 July 1957, promotion points are creditable as of 1 July 1957.
- c. Courses completed at foreign universities are not creditable unless they have been accredited by an American college or university in terms of semester or quarter hours. The burden of translation of foreign credits into acceptable semester hours is placed on the individual officer.
- d. Requests for promotion credit for residency training will be made by the individual officer to the O-in-C ROPRA forwarded via BuMed. The request must be accompanied by a certification from the institution as to type and the inclusive periods training was performed. BuMed will evaluate and certify number of points (not to exceed twelve) assigned for each fiscal year.

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Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U.S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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PREVENTIVE MEDICINE SECTION

Influenza and Pregnancy

One of the questions raised in connection with priorities for immunization against influenza was whether pregnant women are at special risk. An analysis of morbidity and mortality in the State of Connecticut for 1918 suggests that an affirmative answer might be in order.

The author presents data which indicate clearly that a sharp decrease in birth rate and a sharp increase in stillbirth rate occurred in late 1918 at the time of, and just after, the peak of the epidemic. A second greater decrease in birth rate occurred in the summer of 1919, without concomitant rise in stillbirth rate. The decrease in birth rate and high stillbirth rate in 1918 suggests the occurrence of maternal and late fetal deaths during the epidemic. The decrease in the birth rate in the summer of 1919 could have resulted from early fetal deaths in the fall of 1918.

While not conclusive, these data are highly suggestive that influenza in 1918 posed a special problem to the fetus. (Rindge, M. E., Influenza: Connecticut Health Bulletin, 71: 223-229, September 1957)

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Global Malaria War

A multimillion dollar campaign against malaria, expected to be launched soon, could eradicate the disease from the entire world within a decade.

Spearhead of the many-nation drive is a section of the Mutual Security Act of 1957, approved August 14, 1957, Public Law 85-141, which reads:

"The Congress of the United States, recognizing that the disease of malaria, because of its widespread prevalence, debilitating effects, and heavy toll in human life, constitutes a major deterrent to the efforts of many peoples to develop their economic resources and productive capacities and to improve their living conditions, and further recognizing that it now appears technically feasible to eradicate this disease, declares it to be the policy of the United States and the purpose of this section to assist other peoples in their efforts to eradicate malaria."

The section authorized the President to spend up to \$23.3 million in the next fiscal year.

Surgeon General Leroy E. Burney, USPHS, made the following statement to MD Medical Newsmagazine: "With the insecticides and drugs that are now available, malaria eradication is possible almost throughout the world. This is the goal of the broad program visualized by the World Health Organization for which President Eisenhower has proposed special United States support. The eradication of this disease will not only contribute immeasurably toward the advancement of world health, but will also mean economic and social progress for vast areas of the globe."

Experts testified before Congressional committees that for an estimated \$519 million spent in 5 to 10 years, mankind could be freed from the ancient scourge. The United States' share would be 20%; the remainder to be paid by the benefiting nations, the World Health Organization, United Nations International Children's Emergency Fund, Pan-American Sanitary Organization, and other agencies. Immediate feasibility of an eradication campaign is tied to chlorinated hydrocarbon insecticides. Before DDT, malaria control cost 75 cents per capita; eradication was economically out of reach for many countries. Now, despite increased labor and other costs, 25 cents per capita is sufficient for eradication.

The serious problem is that slow eradication programs in poorer countries allow resistance to develop, requiring costlier insecticides and more frequent spraying. The Anopheles mosquito already shows resistance in some regions after 6 to 7 years of exposure to DDT, in one instance after only 18 months of dieldrin spraying; elsewhere no resistance has developed in 11 years. In Greece, malaria control is now no longer effective with these inexpensive sprays. Dr. Burney urged, "It is important that this program be carried out as quickly as possible, when the insecticides and drugs are most effective against the mosquito vectors and the malaria parasites."

Malaria today infests all or part of 60 nations, accounts for 200 million cases a year and 2 million deaths, and costs about \$10 million a year to control at "bearable levels." Long-term effects are chronic anemia, physical disability, and mental lethargy. Four types of malaria are related to four species of malarial parasite: Plasmodium falciparum, vivax, malariae, and ovale. The parasite's life cycle is completed in two phases, one in the female mosquito, the second in man. Infections by some species, notably P. malariae and P. vivax, may remain dormant or relapse after years; thus, any person who has remained in, or even passed through, an endemic area may be suspected of having malaria.

The campaign's aim is to create a series of "islands" of eradication, then enlarge these until their borders meet and full protection is achieved. The method calls for 1 to 3 annual sprayings on walls and ceilings of dwellings where mosquitoes rest after their blood meal; residual sprays are

effective for several months after each spraying. With transmission thus halted, in 2 to 3 years the parasite virtually dies out of the population. Chemotherapy for malaria patients (chloroquine, primaquine, and related compounds) causes the disease to decline in a few months. Surveillance thereafter can be handled by normal public health methods.

The technique has been successfully demonstrated. Examples: The United States and Chile are rid of malaria; the Dominican Republic, Venezuela, and Argentina are nearly so. In the Philippines, 2 years of spraying caused an 80% drop in the incidence of malaria; in Formosa, the rate fell from 1 to 4 to 1 in 200 of the population; in Indonesia, spraying of infested rice areas brought a \$750,000 crop increase at a cost of only \$1400 for DDT.

National governments that have cooperated with the International Cooperation Administration (ICA) in bilateral malaria control activities over the past 14 years show intense interest in eradication which is now nearly within their means for the first time in history. India has 125 millions of its population already protected; Indonesia and Mexico look forward to expanded antimalaria programs; Thailand and the Philippines have eradication within sight. The Public Health Service, ICA, the International Development Advisory Board, as well as international agencies are solidly behind the eradication campaign. (Global Malaria War: MD Medical Newsmagazine, 1: 29-30, September 1957)

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A Challenge

In 1947, the use of streptomycin in the treatment of tuberculosis gave a sudden lift to hopes for the eventual conquest of the disease. Since that time combinations with PAS and isoniazid have provided added effectiveness. Other drugs are being intensively studied in hospitals and sanatoria. This avenue of approach seems certain to improve.

When the surgical removal of the cavitated discharging, and therefore infective, portion of the diseased lung became possible, a wave of optimism struck not only the public, but the medical profession as well. A feeling arose that an early solution to the problem of eliminating tuberculosis would be found. Such optimism is not justified. The attack is still from the wrong angle.

True, the known case, if properly treated, is now restored to the community as a contributor to the economy and not a distributor of infection. However, the process is still slow and painstaking and full of pitfalls for the unwary. Management, if it is to be successful, must be unwavering and uninterrupted and requires the utmost skill and training. The cooperation of the patient and the family is necessary. Treatment must be continued indefinitely after recovery or apparent arrest.

The family physician must be alert. He will be importuned to assume the care in the home of the active case. According to Dr. James E. Perkins, Managing Director of the National Tuberculosis Association, the cost of the average case of tuberculosis is about \$15,000 including medical care, compensation, pensions, relief payments, and loss of wages. Few can bear such a burden without assistance. Nearly everyone wants to be cared for at home.

Few people are sufficiently informed to desire treatment in a sanatorium. Unless the physician is alert to the probable course of the disease and firm in his advocacy of sanatorium care, he may yield to entreaties and attempt home treatment with drugs. Soon the patient becomes aware of the expense involved. In time, he may assume that he has sufficiently recovered and abandon the treatment. This has occurred repeatedly. The physician is left helpless and the patient is often hopeless. Many instances of the situation can be cited by anyone with experience in this field.

In the sanatorium, the entire cost of long-term care is supplied except for the very small percentage of patients who can well afford such expense. In fact, the patient who is charged a token part pays less for sanatorium treatment than for home care. Infinitely more important are skill and specialized medical care by a staff alert by experience to the many pitfalls awaiting the unwary.

In the sanatorium, a rehabilitation program under skilled management is started immediately with education, occupational therapy, medical social service, and vocational guidance and placement, which is the sine qua non of a successful program of restoration. Such a program can be furnished only by an institution. Indefinite follow-up is needed to forestall the consequences of relapse.

However, the attack has just begun in spite of the mounting success in removing the patient with a known case of tuberculosis from his community as a source of infection and restoring him as a productive citizen to the community. While the death rate has already fallen, the incidence still remains little below that of ten years ago. Community-wide surveys, incomplete as they are, reveal shocking numbers of individuals in the infective stage who are unrestricted in the community and seeding the germs of the disease in ways which often cannot be traced.

The 149 new active cases found in Minneapolis and Hennepin County in 1954 illustrate this point. Of these cases, 36% were reported from physicians' offices and public clinics, and 22% were hospital inpatients. Mobile-unit surveys and physical examinations with roentgenograms of apparently healthy people located 23%. Follow-up of contacts of active cases accounted for 7%; 2% were found in death reports and were not previously reported. An additional 10% of the cases had been diagnosed elsewhere.

The average attack rate in 1950 to 1954 by age and sex shows that men over 45 years of age comprise the group most likely to develop tuberculosis

Many of them are still supporting a family. The "dangerous age" for women is from 25 to 44; for every woman who breaks down in this age period, there are almost twice as many men. In the occupational groups, new active case rates in 1954 were highest among the unemployed and next among food handlers and maids.

Routine roentgenographic surveys of all hospital admissions bring to light a significant number of cases. Sanatorium staffs also report a sequence that has not received sufficient attention from the general medical profession. Many cases appearing at first to be atypical, or so-called "virus" pneumonia, recover from the acute attack only to break down much later and prove the original infection to be of tuberculosis origin instead of "virus." The development is usually so insidious and symptomless that only frequent and systematic follow-up can detect this sequence before it becomes a cavitated source of illness and infection.

Conditions in sanatoria throughout the nation quite generally follow a pattern illustrated by the stage of disease on admission recorded in Minnesota's Glen Lake Sanatorium. Approximately 10% are incipient and usually nonspreaders, 50% are moderately advanced, and 40% are definitely far advanced. Thus, nearly 90% of those admitted are spreaders of the disease. The local conditions cited illustrate the fact that innumerable sources of infection are present in a community which prides itself on accomplishment in this field.

Tuberculosis exists throughout the known world and has existed since disease in man became known. The causative organism has been known for only a moment in human history. Success in its suppression has just begun. There is an enormous amount of tuberculosis in countries in which health measures are still retarded.

Through the National Tuberculosis Association, it is learned that if all the known cases of tuberculosis could be eliminated at once in this country, there would still be about 50,000,000 people harboring live, virulent tubercle bacilli in their bodies. This seems incredible until it is remembered that in the vast majority the disorder is inactive. The impressive fact is the widespread silent character of the infection.

Conclusions

1. Efforts to find the active spreader of infection need to be intensified. While greater search must be made among the ethnic, occupational, and age groups most heavily infected, all possible sources must be explored.

2. All known cases must be removed from situations in which they can infect others. Isolation provided by the sanatorium is the only assurance against such infection.

3. Treatment now available must be applied under competent management without prospect of interruption and with complete rehabilitation

as an added objective. Such treatment means sanatorium care.

4. Research must be intensified. There must be no let-down in the provisions for sanatorium care. Adequate facilities must be provided for communities not so equipped.

(White, S. M., Editorial: J. Lancet, January 1957; Abstracted in Tuberculosis Abstracts, Nat. Tuberc. A., XXX: 8, August 1957)

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Automobile Deaths - 1957 Labor Day Weekend

During the 5-day Labor Day weekend (Friday, 30 August through Tuesday, 3 September 1957) a total of 21 Navy and Marine Corps personnel who were occupants of automobiles died as a direct result of traffic accidents.

This toll exceeds the combined totals for the three previous comparable Labor Day periods.

		Total			
	1957	1954 - 1956	1956	1955	1954
Total	21	20	3	12	5
Navy	12	15	3	7	5
Marine Corps	9	5	-	5	-

Of these 21 deaths, 12 occurred on Saturday, 31 August. The greatest number of deaths reported for any single day during the 20-month period, 1 January 1956 through 30 August 1957 was 8. (Statistics of Navy Medicine, October 1957)

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Automobile Accident Prevention - the Physician's Role

Human Factors in Highway Safety, an article by Ross A. McFarland, Ph D. and Roland C. Moore, Ph D., published in the April 25, May 2, and May 9 issues of the New England Journal of Medicine, deserves careful reading by all individuals concerned about automobile accidents. A summary follows:

A review of the problem of accidental deaths and injuries shows that accidents especially those on the highway, have reached epidemic proportions and now constitute a greater threat to the safety of large

segments of the population than diseases do. Because accidental injuries are subject to biologic parameters similar to those influencing pathologic processes, the prevention of accidents is of medical importance and, therefore, becomes a responsibility of the medical officer and physician.

Because of his training in the biologic sciences, and his knowledge of the sense organs, anatomy, physiology, and many aspects of human behavior, the physician is in a favorable position to contribute to the prevention of highway accidents, particularly through the development of adequate physical standards for the licensing of drivers, the determination of the role of various pathologic processes and physical conditions in causing accidents, and the indoctrination of the public regarding the psychologic, physiologic, and medical factors influencing the safety of driving. He can also assist in identifying unsafe features of vehicle design and operation, and the derivation of injury-threshold data for the guidance of automotive engineers in improving subsequent models.

The epidemiologic approach is proposed as a useful framework to present and review the findings from the research on the causes of motor vehicle accidents. The driver is of primary medical concern, but consideration must also be given to the biologic implications of the design of vehicles, and of the environmental variables.

Recent research has indicated that factors of attitude, personality, and adjustment are of greater importance in safe driving than sensory defects, reaction times, or psychomotor skills. Current studies are more precisely defining the differences in character and personality between those with and those without accidents.

The high frequency of accidents among youthful drivers is emphasized and explained on the basis of inexperience and emotional and social immaturity. Adequate training in driving and in safety principles appears to be an effective method of reducing the accidents of this high-risk group.

Experimental findings are presented on a number of conditions in which driving efficiency is temporarily impaired: (1) the characteristic deterioration of skill with fatigue; (2) disorganization of skill with emotional stress; (3) side effects or principal action of various medications and proprietary remedies.

Research has not yet furnished definitive answers to many questions of minimal physical standards for driving and of medical fitness to drive safely. There is great diversity in the requirements of the various states in this connection, and in the prevailing professional opinions and practices. Objective studies are needed to establish cut-off points on an experimental basis, and to define criteria to aid in advising persons with certain physical conditions on the safety of driving.

Designing equipment in terms of human capabilities and limitations is an important means of improving safety. Most of the data in this new field of human engineering—or biotechnology—have been developed by

psychologists, physiologists, and anthropologists, but the physician—because of his training—can also make a significant contribution.

It is important also to relate the influence of variables in the environment to the capabilities and limitations of drivers. Information is presented concerning the level of illumination as a factor influencing human vision, the design of highways in accordance with human engineering principles, and the role of social forces in modifying and determining the attitudes that underlie the behavior of drivers exhibited on the highways. The research needs in these areas are emphasized.

The physician in close collaboration with other biologic scientists and engineers on carefully controlled experimental and clinical studies, epidemiologic surveys, and statistical analysis could provide future significant advances in safety.

(A summary of another valuable article by Ross A. McFarland, Ph D., appeared in the Medical News Letter, Volume 29, Number 9, dated May 3, 1957)

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Application of Experimental Psychology to Man/Machine Systems

For the past two hundred years, there has been an increasing tendency to substitute power from inanimate sources (water, coal, and oil) for human muscle power. This trend has been accelerated enormously in the last few decades by the use of electricity as a method of transferring energy from one point to another. For this reason, the worker is required not so much as an engine, but more as a link in a communication system. He controls the application of power by moving levers, turning knobs, or feeding machines with material. In this situation, the limiting factor on rate of work is not body metabolism, but the capacity to select and interpret the relevant sensory cues.

This is the province of the experimental psychologist who can, therefore, utilize his skill to assist in the solution of practical problems. The basic concepts of this work are that a man cannot respond accurately without adequate knowledge of the situation, he cannot learn without knowledge of results, and he can only attend to one signal at a time. In more technical language, he can be regarded as a single-channel servo-mechanism. Engineering psychologists have profited considerably by adopting many of the concepts of communication theory. The term servo-mechanism, for example, emphasizes the importance of feed-back and the part played by proprioception in the skilled behavior of healthy people. It is also valuable as a term which can be applied equally to men or machines. Given this common terminology, it is possible to study man/machine systems as

one unit and to describe the properties of each part and of the whole system in the same language.

The study of aircraft cockpit displays is an excellent example of the progress which has been made. When first studied, the problem was that a pilot had too many dials to look at and their arrangement was dictated either by convention or by mechanical convenience in construction. By studying the frequency of use of each and the order in which they are used, it was possible to rearrange the control panel so that eye movements and changes of fixation were reduced to a minimum. This in itself made the task easier, but further improvements were made by presenting several items of information on one dial instead of having separate instruments for each property of the machine or its relation to the environment. The present work in this field has advanced to an even more elaborate stage where separate items of information are integrated electronically before presentation on the dial, thus reducing the mental load on the pilot.

The same procedure can be followed on industrial machinery. For example, the British Iron and Steel Research Association have a Human Engineering or Ergonomics Unit which is concerned with the design of crane-cabs. Just as the military engineering psychologists began by determining the frequency of dial use, so these research workers have carried out experiments to determine the frequency with which various speeds are used by the setting of the control levers.

The psychologist has been particularly useful as a student of sensory mechanisms. In this respect, he is complementary to the motion-study engineer who has concentrated his attention on motor aspects of skill. Superficially, the effector-side may appear to be an easier subject of study since results are more directly observable, but in terms of scientific analysis faster progress is being made on the receptor side where, excepting kinaesthesia, the processes are more easily separable both neurologically and behaviorally. In spite of the progress of academic research, it must be admitted that the area of knowledge which can be applied directly is small and the psychologist who works on industrial man/machine systems relies extensively on concepts which are scientifically trivial to a point where they can often be called commonsense. Nevertheless, his contribution is valuable because a sound training in the biological sciences appears to be one of the best ways of insuring that an investigator can perceive what to him are the obvious faults of man/machine systems designed entirely by engineers. For example, if given the problem of crane design, he can make a valuable contribution simply by pointing out that if accidents are to be avoided, the eyes must be used almost continuously to observe the position of the load. This means that the cab structure must be designed so that vision is never interrupted and other necessary information must be transmitted through different sensory channels. Control levers can be designed so that proprioception and touch are adequate to convey information concerning the location of the controls and the extent to which they have been

moved. Warning signals concerning overload, dangerous positioning, or other emergencies can be conveyed by sound stimuli. (Singleton, W. T., (Great Britain), The Application of Experimental Psychology to Man/Machine Systems: Summaries of papers presented at the XII International Congress on Occupational Health, Helsinki, Finland, 1-6 July 1957, II: 20-21)

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Hazards to Health from Ozone

In recent months, the subject of the toxicity of ozone has received widespread publicity. Research in the field reveals that ozone in acute exposures is a highly toxic and lethal substance. Chronic low-level exposures may result in severe systemic disease.

Ozone consists of three atoms of oxygen arranged in the form of an isosceles triangle. It is formed by the action of ultraviolet light on oxygen and by electric discharge in oxygen. At low concentrations, it has the odor of clover or "new-mown" hay. At concentrations above 5 parts per million by volume, it has an obnoxious, acrid odor. Ozone will oxidize most metals and organic compounds to the next higher oxidation state. Rubber and plastic compounds are most readily attacked, while stainless steel and aluminum are the most resistant of the common materials of construction. Ozone in the liquid form will explode, initiated by some heavy metals, organic compounds and moisture.

Toxicity

Although no human fatalities are known to have been reported from exposure to ozone, it is considered to be a hazard to health of the same order as the war gases. The maximum allowable concentration is only 0.10 parts per million by volume in air. Above this concentration, definite symptomatic effects are evident. The most pronounced effects are pulmonary edema and hemorrhage. Secondary effects are: (1) irritation of the mucous membranes with the possible production of a mucous discharge; (2) headaches; (3) lethargy; (4) severe pains in the chest (sub-sternal pressure); and (5) narcosis at low concentrations. Because of the similarity of ozone poisoning to other conditions showing pulmonary involvement, ozone poisoning often is not suspected. An occupational health survey should be conducted in order to rule out ozone poisoning in patients with pulmonary involvement suspected as being an occupational connected disease.

Occupational exposure to ozone in harmful concentrations can result from the following operations:

1. Arc welding—especially the consumable electrode—gas shielded process. The most severe case of ozone poisoning reported is attributable to this process. Several other less serious cases have also been reported.

2. The use of ultraviolet light spectrographs. Prolonged experimental procedures with this instrument have produced dangerous concentrations of ozone in the immediate vicinity.

3. The use of ozonizers in confined perishable food storage areas as an aid to check bacteria and fungus growth.

4. Electric discharge in the testing of electric insulators.

5. Bombardment of liquid nitrogen contaminated with oxygen. Liquid ozone is formed when liquid nitrogen containing oxygen as an impurity is used as a coolant for a target material subjected to bombardment by atomic and nuclear particles from a particle accelerator.

6. There are several commercially available room ozonizers which are designed to deodorize or "freshen" room air and to have a bactericidal action. (The hazard to health from ozone is considered to outweigh the value of an ozonizer as a deodorizer or bactericidal agent in living or working areas.)

Protective Measures

The following protective measures should be employed to reduce or eliminate the hazard to health from ozone:

1. Where possible, the hazardous condition should be engineered out by the use of ventilating systems and local exhaust systems.

2. In welding operations where it is not feasible to exhaust the gaseous products, welders should be provided with a respirator equipped with a cartridge containing a reducing agent such as manganese dioxide. These are not currently available as a standard item, but may be procured through local purchase. Warning signs should be posted to alert nonwelders to the hazard.

3. Liquid ozone can be reduced to oxygen by a suitable reducing agent. When liquid ozone is used, storage containers should be kept below -183°C . At this temperature, the vapor pressure is sufficiently low to preclude the formation of hazardous concentrations of gaseous ozone in the air.

4. Warning signs should be placed on perishable food lockers equipped with ozonizers. Personnel should not be permitted to occupy these lockers longer than is necessary to accomplish their mission. (Joint TB Med 256/ AFP 160-6-12, Hazards to Health from Ozone, 20 August 1957)

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The printing of this publication was approved by the Director of the Bureau of the Budget, 16 May 1955.

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Equipment for Helicopter Insecticide Dispersal

In order to take advantage of the ever widening use of the helicopter by the Naval service, a project was established two years ago at the Medical Field Research Laboratory, Camp Lejeune, N. C., for the development of insecticide dispersal equipment suitable for use on the larger models of Navy and Marine Corps helicopters. A prototype liquid dispersal apparatus suitable for this purpose has now been completed, successfully field tested, and used. This device consists essentially of a pair of spray booms extending out on both sides of the helicopter fuselage in a delta design, with the pumping assembly and reservoir mounted within the cargo compartment. The insecticide is discharged from the booms through a series of Tee-jet brand nozzles and is distributed over a wide area by the turbulence provided by the helicopter rotors.

Features of this equipment which distinguish it from all previous helicopter insecticide dispersal equipment are that it can be constructed from standard equipment and can be readily and quickly mounted and dismounted without significant alterations to the aircraft. For the first time, a Navy potential exists for the selected spot treatment with insecticides of otherwise inaccessible or difficult to treat areas. Standardization and subsequent production of this new equipment item are currently under consideration by the Bureau of Aeronautics. (NavMedFldRschLab, Report NM 51 02 09.1.9, September 1957)

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WASHINGTON, 25, D.C.

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